# THE EFFECTS OF SEVERE WEATHER ON WADERS: GUIDELINES FOR THE COLLECTION OF DATA AND ANNOUNCEMENT OF WADER STUDY GROUP PROJECT

## by Nick Davidson and Nigel Clark

As a result of the two recent severe winters (1978/79 and 1981/82), there has been increased awareness of, and interest in, the effects of severe weather on waders, particularly since the implementation of statutory wildfowling bans and their consequent effects on wader-catching. In the last issue of the Bulletin we summarised the known effects on waders in Britain of the severe weather in 1981/82, and the consequences of the wildfowling bans during this period (Clark 1982, Davidson 1982, Evans 1982, Townshend 1982). Since then, national ringing recoveries have also been used to attempt to quantify the effects of severe weather in 1981/82 on mortality (O'Connor & Cawthorne 1982). Despite better collection of information than in previous cold spells, much valuable data was lost during last winter. There are still large gaps in our knowledge of how waders coped with the severe weather in different areas, and whether the timing and duration of wildfowling bans aided the survival of waders. As promised in Bulletin 34, we now discuss how information should be collected when severe weather next strikes, so as to maximise the value of the data. Since severe weather may occur in many different areas, we propose to coordinate data collection as a new Wader Study Group Project. First, we shall outline some of the questions about the behaviour of waders in cold weather, on which further information is needed. Second, we shall discuss how data should be collected. Most of these questions were outlined by Evans (1981). Others raised in his article, such as the effects of high winds on waders, and the consequences of different patterns of interestuarine movements by waders on their seasonal weight cycles and survival in severe weather, are not covered by this survey.

Information is particularly needed on three points:

1. Mortality

a) When and where do waders die? Mortality seems generally higher on the east than on the west and south coasts of Britain, but heavy mortality is often very localised. For example, at Montrose Basin and the Moray Firth in 1981/82 (Clark 1982). However, mortality in some other areas such as the Wash has undoubtedly been underestimated. On previous occasions site checks have been too infrequent to establish on which specific date waders died. This information is extremely important to establish which weather conditions, acting for which time periods, cause mortality.

b) Which species die; and are some individuals in a population more vulnerable than others? Some previous localised surveys have yielded useful information, for example on the north coast of the Wash (Pilcher 1964, Pilcher et al. 1974), but there has been no comprehensive widespread survey other than the RSPB's Beached Bird Survey which was not primarily concerned with waders or cold weather. Redshanks Tringa totanus, Oystercatchers Haematopus ostralegus and Dunlins Calidris alpina often suffer the highest mortality (e.g. Davidson 1981a, Clark 1982) but appreciable numbers of other species such as Grey Plovers Pluvialis squatarola, Curlews Numenius arquata and Turnstones Arenaria interpres are sometimes reported dying. A higher proportion of juveniles than of adults are often thought to die, but this has seldom been quantified. Very recently, we have found evidence that small individuals are more at risk in severe weather than large individuals of the same species (Evans & Davidson 1982). Both the age and size of waders dying in severe weather need further study.

c) What is the body condition at death of waders dying in severe winters? Even in the very low temperatures of January 1982, waders at Montrose were able to mobilise their fat reserves fast enough to balance heat loss. However, once fat had been used up, many died because they could not metabolise protein fast enough to maintain body temperature and not because protein reserves were exhausted (Evans & Davidson 1982). Few carcasses were collected elsewhere so we need to find out if this is the cause of death elsewhere, and at other times of year.

2. Numbers and Movements

a) Do numbers, and dates of arrivals and departures, of waders differ between mild and severe winters? Although "cold-weather movements" by Lapwings Vanellus vanellus and Golden Plovers Pluvialis apricaria are well known, it has only recently been proved that some coastal waders move between estuaries in response to the onset of severe weather (Davidson 1981a, Townshend 1982). Does this occur more widely? Do such movements occur only if cold weather occurs exceptionally early in the winter?

b) How are the numbers of birds dying related to the number of birds present?

c) How do movements affect weights of waders? (see below). Low weights could indicate the recent arrival of birds from other areas, as seems to happen in some winters in Dunlins and Knots at Teesmouth in early December (Davidson 1981b).

3. Weights of Live Birds

a) What are the normal (mild winter) weights of each species in different British estuaries? Data on these are needed for comparison with weights in severe weather.

b) When do weights fall below their normal levels in severe weather? i.e. under what weather conditions are internal reserves of fat and muscle protein used? Which species are most severely affected?

c) How rapidly do waders regain their normal weights? Very little reliable information exists on this point (Evans & Davidson 1982). During 1981/82 the failure to obtain such information was chiefly a consequence of the limited amount of wader catching allowed due to the confusion over cannon-netting bans. In other years, birds have often not been weighed during cold weather, or catches have not been made frequently enough to determine recovery rates accurately.

Answers to these questions are important in their own right. They will also allow us to see if the timing and conditions under which statutory wildfowling bans are imposed are indeed those times when waders are having most difficulty in meeting their energy requirements. We will also be able to assess whether the duration of a ban (currently lifted eight days after the end of severe weather) is sufficient to allow waders to regain fully the fat and protein reserves lost during severe weather. The present meteorological criteria for imposing and continuing wildfowling bans are detailed by Evans (1982).

The new WSG project aims to answer these questions by coordinating the collection of information on future winters in three ways: (1) tideline searches for corpses, (2) population counts, and (3) catching. To collect this information

we need a network of observers covering as many areas, especially coastal areas, as possible. It is equally important to monitor those areas, for example in southern and western England, where coastal weather conditions seldom become severe, as to monitor areas where severe weather is often recorded. There are three reasons for this. Firstly, mortality of waders does sometimes occur during severe winters in normally mild regions (Ash 1964, Dobinson & Richards 1964). Secondly, we need to establish the extent of the regions in which waders are being affected in each future severe period, thus providing information should future wildfowling bans be applied on a regional basis. Thirdly, do waders move to milder areas to avoid severe weather?

Details of suggested methods for collecting the information are listed below.

1. Tideline Searches. Searches for wader carcasses should be made as frequently as possible throughout the winter, and during severe weather at intervals of no more than one week. Try to search the same area or length of tideline on each visit. On each visit, collect all wader carcasses: otherwise the exact timing of mortality is difficult to judge. We need to examine all carcasses for two reasons: 1) to identify their age, sex, body size and racial origin, and 2) to assess their body condition and to establish the cause of death. Black plastic dustbin bags (or similar) are suitable for the collection and storage of carcasses. Label each carcass clearly with a numbered tag on one leg, or place each, with a label, in a separate small ploythene bag. On each label, and/or a separate sheet, record the date and place of finding, weight, and any measurements that you have taken. You should then either 1) store the carcasses in a deep-freeze, and contact us so that we can arrange their transfer or collection, or 2) (only within the UK) post the carcasses to us immediately. If you post carcasses, they should be well wrapped in polythene bags inside strong external wrapping, preferably a tin (to prevent leakage in the post, which contravenes Post Office regulations), and sent by first-class mail. Mark the package "Pathological Specimens - URGENT". All intact or nearly-intact carcasses must be weighed (to the nearest 1 g if possible) soon after finding, certainly before freezing or postal despatch: carcasses lose water whether deep-frozen or at normal temperatures, so we cannot assess body condition without a weight taken as soon after death as possible. If, as a last resort, you cannot for any reason store or post carcasses, and you are unable to contact us, record the weight and biometrics of each carcass on standard WSG green forms.

2. Population counts. Try to standardise when and where you count, since we need comparable counts through the winter to find changes in numbers. Therefore, counts do not necessarily have to be comprehensive. In general, it is better to count birds at roost rather than at low water, but local conditions may sometimes preclude this. During severe weather make sure that the roosts do not move to other sites! Try to count at intervals of one week or less. During mild weather, counts should ideally be made at fortnightly intervals, on spring tides. If counting all wader species is not possible, concentrate on those that are usually most sensitive to severe weather: Redshank, Oystercatcher, Dunlin and Sanderling. We will discuss with the new BTO Estuaries Officer how to maximise the value of cold weather counts in relation to the Birds of Estuaries Counts, and how to avoid any conflict between this project and the Birds of Estuaries Enquiry.

3. Catching. The announcement in the most recent Ringer's Bulletin (Vol.6(1), June 1982) is now out of date: after considering a document prepared by Durham University (P.R.Evans) and the Wader Study Group (M.W.Pienkowski), the Advisory Panels to the Secretaries of State approved exceptions to the wader-catching bans during future severe weather for those groups actually participating in the type of study described in this article. Groups likely to be able to contribute have been contacted. Ringers not exempted from wader-catching bans are encouraged to participate in this project, particularly by collecting data before and (especially) after severe weather, to examine recovery times. The main justification for catching waders during severe weather is to assess their body condition, to see if they are meeting their energy requirements. Therefore, all waders caught during severe weather must be weighed, and measurements taken. Under no circumstances should waders be ringed and released without weighing, as has happened frequently during previous severe winters. Both during and after severe weather, pay particular attention to any previously-ringed bird, since weights of individuals yield more valuable information on recovery times than weights of unringed samples can provide. Large catches are not necessary (and may not be advisable in severe weather) but if they are made it is important to estimate weight loss during captivity, so that this can be corrected for in analysis of the weights. Measure weight loss by ringing and weighing a small sample of each species immediately after capture, and reweighing them after all others have been processed. [See Wilson & Davidson (this issue) for more details.] Whenever possible, concentrate on making a series of catches of the same species before, during and after severe weather. This will yield the best information on any losses and subsequent recovery of weight. Particularly when increased mortality is noted, try to catch vulnerable species such as Redshank and Oystercatcher so that the condition and identity of the surviving birds can be determined. In severe weather remember that good data is essential and that the welfare of the bird is of paramount importance. Smallish catches efficiently and expeditiously handled are best. All catch data should be sent, as usual, on WSG green forms to Mike Pienkowski. Please send in sheets for catches during and after severe weather as quickly as possible, and enclose a note pointing out that information from such periods is included.

To ensure that adequate coverage of any severe weather is achieved, monitoring should start on 1 October and end on 31 March. We intend to start the project for the forthcoming winter, i.e. on 1 October 1982. There are two reasons for this. Firstly, if the 1982/83 winter is mild it will provide valuable baseline information of 'normal' mortality, numbers and weights, with which to compare data collected during severe weather. Secondly, we (like weather forecasters) are not clairvoyant. Therefore, we cannot predict when severe weather will occur, so the project must be running before the onset of severe weather. During mild weather, we suggest that tideline searches and counts should be made at fortnightly intervals, just after the highest spring tides. After one week of minimum air temperatures at or below o°C, try to increase the frequency of monitoring to intervals of one week or less. This increased frequency should continue for two weeks after a wildfowling ban is lifted. However, even if you feel unable to monitor an area as often as this, please participate in the project, since any information will be useful. If you can help by searching tidelines, counting birds or catching before, during and after severe weather, please complete the registration form enclosed with this Bulletin and return it to us as soon as possible.

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# LEG 'CRAMP' AND ENDOPARASITES

## by David S. Melville

The causes of leg 'cramp' in waders are not fully understood (WSG Bull. 24:24, 27:19-21, 28:15-16). Stanyard (WSG Bull. 27:19-21) reported that the three casualties out of 110 Curlews Numenius arquata caught were in a less advanced state of moult than the other birds and noted that 'this might indicate poorer condition'. However, Purchase and Minton (WSG Bull. 34:24-26) found that female Bar-tailed Godwits Limosa lapponica with much subcutaneous fat (i.e. in 'good' condition) seemed more likely to suffer from 'cramp' than males or juveniles.

During the winter of 1980/81, a total of 256 Redshanks Tringa totanus were caught at night in mist nets in central Thailand. Of these, nine suffered from 'cramp', despite being placed in tall keeping boxes (WSG Bull. 20:21-24) after capture, and were killed. A further four apparently healthy birds were also collected (two caught by the author and two from local bird nets. Of the latter, one was found freshly dead, and the other alive but with a dislocated leg). All specimens were prepared as museum skins. Brief examination of the carcasses revealed that five of the nine 'cramp' victims had some endoparasites (nematodes, cestodes, trematodes), and in several cases the burdens were heavy. None of the four healthy birds showed signs of endoparasite infestation. (All parasites are awaiting identification.) It is therefore possible that waders with endoparasite burdens and so possibly in poor condition, may be more liable to 'cramp' than waders in better condition. To further examine the possibilty of a link between endoparasite burden and leg 'cramp', it would be useful if those people with access to 'cramp' victims examine them for endoparasites as well as determining general body condition.

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# INLAND WADER COUNTS - SECOND PROGRESS REPORT

## by OAG Münster

The Inland Wader Count project has now been in existence for three years in some parts of Europe. On the one hand, this period is much too short to yield really valuable conclusions based on the data received so far, so it is not yet possible to give any final results. On the other hand, it is nevertheless admirable that, for such a long time, so many people have spared neither pains nor costs to count waders on wet, muddy and sometimes badly smelling sites week after week. We would like to thank all contributors to the project for their help given so far.

The main aim of the project in the next years must be to maintain the level of work which has been reached - i.e. it is very important to continue counting waders at those sites which are already involved in the programme. Only in this way can certain questions, like changes of numbers of inland resting waders be answered. The success of the project depends, as before, on the work of the volunteers and we hope that they will continue supporting the Inland Wader Counts in the next years.

The map (Fig.1) shows the distribution of counting sites. Sites, where counts were not regular, but a reasonable number of counting data are available or promised, are also included.

Presenting results of the project would be somewhat difficult at this moment, since computer storing of the data has not yet been finished and compiling the material by hand would be tiresome. For these reasons we tried simply to see what we could do with the data for one species which is widespread and numerous at nearly all sites - the Common Sandpiper Actitis hypoleucos. The following results are, of course, very preliminary, since most data came from one year only and, at the time of evaluation, not all data from all sites were available.

We briefly referred to resting numbers of Common Sandpipers in WSG Bulletin 29: 8-9. As mentioned there, this species does not show any tendency to build up large concentrations of birds at certain sites. Figure 2 shows that during the spring and autumn migration periods, resting numbers (totals of birds counted on the fixed counting dates - single missing numbers being interpolated) did not depend on the sizes of the resting sites (given as the estimated sizes, in hectares, of available mudflats and shallow water regions. Therefore, resting numbers of Common Sandpipers on the different sites are probably regulated by other factors than the extent of possible feeding grounds.